New Hampshire
Diesel Smoke Opacity Testing Program
for Trucks and Buses

IT'S THE LAW!

Heavy-duty diesel trucks and buses registered in or passing through New Hampshire are subject to smoke testing.

- **WHO?** All heavy-duty (10,000 lbs GVRW and above) diesel trucks and all diesel buses manufactured to carry 25 or more passengers.
- **WHAT?** New Hampshire state law requires heavy-duty vehicles to submit to random roadside diesel opacity testing when requested by the appropriate authority.
- **WHERE?** Testing can be performed by New Hampshire Motor Vehicle Inspectors during roadside Motor Carrier Safety Assistance Program (MCSAP) inspections at tolls and scales, and during roadside stops as may be deemed appropriate.
- **WHEN?** The program began in 1999 and runs year round although there is limited testing during the cold weather months.
- **HOW?** The test is called the "snap test" or Snap Acceleration Test Procedure (SAE J1667). It is a simple and brief test involving a meter that is placed in the stack to measure smoke opacity as the driver "snaps" the accelerator several times while the engine is in neutral.
- **WHY?** Diesel engines should not smoke. An engine that smokes is emitting numerous toxic compounds, particulate matter and oxides of nitrogen and sulfur that can adversely affect public health and the environment.

EXEMPTIONS: If you have documentation that your truck passed a diesel smoke opacity test in New Hampshire or another participating northeast state within the past year, and your truck is not emitting visible smoke, you will be exempt from the test. If you failed a previous test and can present written evidence of appropriate repairs, and your truck is not displaying smoke, you will be excused.

FINES: Fines may be assessed to owners/operators of trucks that fail the opacity test. The fine schedule is **$100** for a first violation, **$300** for a second violation, and **$500** for a third violation within a consecutive 12 month period. Violations which occur and are documented by other participating states count towards prior violations.

PREVENTION: Any owner/operator of a vehicle that has obvious smoke problems should take steps **now** to repair the problems. Most such repairs are minor engine adjustments that may cost less than your first fine. Listed on the back are some tips regarding smoke opacity, potential causes and possible repair strategies.

OPACITY: A QUICK GUIDE. Opacity is the degree to which smoke blocks light, and it is the basis of the measurement officers will take when testing your truck. Keeping in mind that a well-maintained diesel engine should not emit any smoke, the following is a very general approach to determining whether you may need to do preventative repairs on a particular truck:

- ❑ **No smoke or light, thin smoke**: An engine that is not emitting any smoke or emits very little smoke is likely operating efficiently and will pass the opacity test (opacity level less than 20%).
- ❑ **Gray to light black smoke, medium stream**: Smoke like this could indicate opacity levels of 20-40%. Diesel trucks and buses newer than 1990 will fail if opacity is greater than 40%. Smoke in this color range may indicate the initial stages of a problem and should be checked out.
- ❑ **Black smoke, thicker stream**: Black smoke indicates a problem. The darker and thicker the smoke stream, the more likely it is that the opacity level is greater than 55%. Diesel trucks and buses of age 1974 and newer would fail at this level.
- ❑ **Dark black smoke, thick stream**: Diesel trucks and buses emitting thick clouds of dark black smoke may have opacity readings above 70%. Diesel trucks and buses of age 1973 and older will fail at this level.

WHAT ARE THE CAUSES? Poorly maintained or malfunctioning engines and engines that have been tampered with emit excessive smoke. Some common maintenance problems are:

- ✓ Clogged, worn or mismatched injectors or misadjusted injection timing.
- ✓ Clogged or worn fuel filters.
- ✓ Restricted air filters.
- ✓ Defective turbocharger or blower.
- ✓ Bad fuel.
- ✓ Defective puff limiter or aneroid valve.

The engine may also have been tampered with in some ways, for example:

- ✓ Smoke puff limiters or aneroid valve.
- ✓ Fuel injection timing.
- ✓ Fuel pump calibration.

REPAIRS: Some possible repair strategies (by qualified technicians) are:

- ✓ Adjust air-fuel ratio.
- ✓ Clean or replace air filter.
- ✓ Adjust or repair turbocharger.
- ✓ Adjust or replace throttle delay and/or puff limiter.
- ✓ Examine governor, fuel rack and injector timing for possible adjustment.
- ✓ Clean injector nozzles.

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